IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An optical amplifying method in which at least one optical amplifier is connected to an optical transmission line, an optical signal transmitted to said optical transmission line is amplified by said optical amplifier while an optical power of the optical signal on the optical transmission line is detected, and gain of the optical amplifier is controlled in response to an optical power of thus detected, the method comprising the steps of.

detecting an optical input and output power of said optical amplifier;

obtaining a difference between gain of said optical amplifier and target gain on a basis of detected optical input and output power;

implementing a proportional calculation and an integral calculation of said difference by an automatic constant gain control device to obtain a drive current of at least one pump laser diode provided in said optical amplifier; ~~and~~

controlling gain of said optical amplifier by controlling current of said pump laser diode based on a calculated drive current value; and

adjusting control parameters of said automatic constant gain control device in response to a detected result obtained by detecting the optical input power to said optical amplifier, wherein

the drive current of said pump laser diode is obtained by the automatic constant gain control device with said control parameters adjusted.

Claim 2 (Canceled).

Claim 3 (Currently Amended): The optical amplifying method as claimed in claim ~~2~~1, wherein in said step of adjusting said control parameters, proportional constant of a proportional circuit in the automatic constant gain control device as said control parameters is adjusted.

Claim 4 (Currently Amended): The optical amplifying method as claimed in claim ~~2~~1, wherein in said step of adjusting said control parameters, said optical input power from a optical device connected with said optical amplifying apparatus or said optical input power varied by add/drop function of an optical signal of wavelength division-multiplexing device in said optical device connected with said optical amplifying apparatus is detected, and the control parameters of said automatic constant gain control are adjusted in response to a detected result.

Claim 5 (Original): The optical amplifying method as claimed in claim 4, wherein in said step of adjusting said control parameters, proportional constant of a proportional circuit in the automatic constant gain control device as said control parameters is adjusted.

Claim 6 (Currently Amended): An optical amplifying method in which at least one optical amplifier and at least one wavelength division-multiplexing device are connected to an optical transmission line, an optical signal transmitted through said optical transmission line is amplified by said optical amplifier while an optical power of the optical signal on the optical transmission line is detected, and gain of the optical amplifier is controlled in response to an optical power of thus detected, the method comprising of the steps of:

inputting/outputting optical signals of prescribed wavelengths to/from said optical transmission line by said optical wavelength division-multiplexing device;

detecting an optical input/output power of said optical amplifier;

obtaining a difference between gain of said optical amplifier and target gain on a basis of detected optical input/output power;

implementing a proportional calculation and an integral calculation of said difference by an automatic constant gain control device to obtain a drive current of at least one pump laser diode provided in said optical amplifier; and

controlling gain of said optical amplifier by controlling current of said pump laser diode based on a calculated drive current value; and

detecting an optical input power to said optical amplifier, and adjusting control parameters of said automatic constant gain control device in response to a detected result, wherein

a drive current of said pump laser diode is obtained by the automatic constant gain control device with said control parameters adjusted.

Claim 7 (Cancelled):

Claim 8 (Currently Amended): The optical amplifying method as claimed in claim ~~7~~6, wherein in said step of adjusting said control parameters, proportional constant of a proportional circuit in the automatic constant gain control device as said control parameters is adjusted.

Claim 9 (Currently Amended): The optical amplifying method as claimed in claim ~~7~~6, wherein in said step of adjusting said control parameters, said optical input power from an optical device connected with said optical amplifying apparatus or said optical input power varied by add/drop function of an optical signal of wavelength division-multiplexing device

in said optical device connected with said optical amplifying apparatus is detected, and the control parameters of said automatic constant gain control are adjusted in response to a detected result.

Claim 10 (Original): The optical amplifying method as claimed in claim 9, wherein in said step of adjusting said control parameters, proportional constant of a proportional circuit in the automatic constant gain control device as said control parameters is adjusted.

Claim 11 (Currently Amended): An optical amplifying apparatus for amplifying an optical signal on an optical transmission line comprising:

at least one optical amplifier amplifying an optical signal inputted into the optical transmission line;

an optical power detecting device for detecting an optical power of the optical signal on the optical transmission line;

a gain detecting device to detect gain of said optical amplifier;

a difference calculating device to obtain difference between a detected gain and a target gain; ~~and~~

an automatic constant gain control device for implementing a proportional calculation and an integral calculation of said difference to obtain a drive current of at least one pump laser diode provided in said optical amplifier and controlling gain of said optical amplifier to be constant by controlling current of said pump laser diode based on a calculated drive current value; and

an adjusting device for adjusting control parameters of said automatic constant gain control device in response to a detected result of an optical input power to said optical amplifier which is detected by the optical power detecting device, the automatic constant gain

control device with said control parameters adjusted to control a gain of the optical amplifier in response to optical input/output power detected by the optical power detecting device.

Claim 12 (Cancelled):

Claim 13 (Currently Amended): The optical amplifying apparatus as claimed in claim ~~12~~11, wherein said automatic constant gain control device includes a differential circuit for subtracting gain of the optical amplifier from a target gain, that yields a difference between gain of the optical amplifier and a target gain, and a proportional circuit for multiplying proportional constant of the proportional circuit and said difference, and said adjusting device adjusts proportional constant of the proportional circuit as the control parameters.

Claim 14 (Currently Amended): The optical amplifying apparatus as claimed in claim ~~12~~11, wherein said adjusting device adjusts control parameters of said automatic constant gain control device in response to a detected result of said optical input power from an optical device connected with said optical amplifying apparatus detected by said optical power detecting device or said optical input power varied by add / drop function of an optical signal of wavelength division-multiplexing device in said optical device connected with said optical amplifying apparatus.

Claim 15 (Original): The optical amplifying apparatus as claimed in claim 14, wherein said automatic constant gain control device includes a differential circuit for subtracting gain of the optical amplifier from a target gain, that yields a difference between gain of the optical amplifier and a target gain, and a proportional circuit for multiplying

proportional constant of the proportional circuit and said difference, and said adjusting device adjusts proportional constant of the proportional circuit as the control parameters.

Claim 16 (Currently Amended): An optical amplifying apparatus for amplifying an optical signal on an optical transmission line comprising:

at least one optical amplifier amplifying an optical signal transmitted through the optical transmission line;

an optical power detecting device for detecting an optical power of the optical signal on the optical transmission line;

a wavelength division-multiplexing device for add / drop function of an optical signal of a prescribed wavelength to/from said optical transmission line;

a gain detecting device to detect gain of said optical amplifier;

a difference calculating device to obtain difference between a detected gain and a target gain; ~~and~~

an automatic constant gain control device for implementing a proportional calculation and an integral calculation of said difference to obtain a drive current of at least one pump laser diode provided in said optical amplifier and controlling gain of said optical amplifier to be constant by controlling current of said pump laser diode based on a calculated drive current value; and

an adjusting device for adjusting control parameters of said automatic constant gain control device in response to a detected result of an optical input power to said optical amplifier which is detected by the optical power detecting device, the automatic constant gain control device with said control parameters adjusted to control a gain of the optical amplifier in response to optical input/output power detected by the optical power detecting device.

Claim 17 (Cancelled):

Claim 18 (Currently Amended): The optical amplifying apparatus as claimed in claim ~~17~~16, wherein said automatic constant gain control device includes a differential circuit for subtracting gain of the optical amplifier from a target gain, that yields a difference between gain of the optical amplifier and a target gain, and a proportional circuit for multiplying proportional constant of the proportional circuit and said difference, and said adjusting device adjusts proportional constant of the proportional circuit as the control parameters.

Claim 19 (Currently Amended): The optical amplifying apparatus as claimed in claim ~~17~~16, wherein said adjusting device adjusts control parameters of said automatic constant gain control device in response to a detected result of said optical input power from an optical device connected with said optical amplifying apparatus detected by said optical power detecting device or said optical input power varied by add/drop function of an optical signal of wavelength division-multiplexing device in said optical device connected with said optical amplifying apparatus.

Claim 20 (Original): The optical amplifying apparatus as claimed in claim 19, wherein said automatic constant gain control device includes a differential circuit for subtracting gain of the optical amplifier from a target gain, that yields a difference between gain of the optical amplifier and a target gain, and a proportional circuit for multiplying proportional constant of the proportional circuit and said difference, and said adjusting device adjusts proportional constant of the proportional circuit as the control parameters.

Claim 21 (Original): An optical amplifying apparatus for amplifying an optical signal on an optical transmission line comprising:

at least one optical amplifier for amplifying an optical signal transmitted to the optical transmission line;

an optical power detecting device for detecting an optical power of the optical signal on the optical transmission line;

an automatic constant gain control device for controlling gain of the optical amplifier to be constant; and

an adjusting device for adjusting control parameters of the automatic constant gain control device in response to a detected result of an optical output power from said amplifier which is detected by the optical power detecting device.

Claim 22 (Currently Amended): An optical amplified transmission system for amplifying an optical signal transmitted to the optical transmission line by a plurality of optical amplifying apparatuses connected in series including at least one optical amplifying apparatus which includes:

at least one optical amplifier amplifying an optical signal inputted into the optical transmission line;

an optical power detecting device for detecting an optical power of the optical signal on the optical transmission line;

a gain detecting device to detect gain of said optical amplifier;

a difference calculating device to obtain difference between a detected gain and a target gain; and

an automatic constant gain control device for implementing a proportional calculation and an integral calculation of said difference to obtain a drive current of at least one pump

laser diode provided in said optical amplifier and controlling gain of said optical amplifier to be constant by controlling current of said pump laser diode based on a calculated drive current value, wherein

the optical amplifying apparatus further includes an adjusting device for adjusting control parameters of said automatic constant gain control device in response to a detected result of an optical input power to said optical amplifier which is detected by the optical power detecting device, the automatic constant gain control device with said control parameters adjusted controlling gain of the optical amplifier in response to optical input/output power detected by the optical power detecting device.

Claim 23 (Cancelled):

Claim 24 (Currently Amended): The optical amplified transmission system as claimed in claim ~~23~~22, wherein said automatic constant gain control device includes a differential circuit for subtracting gain of the optical amplifier from a target gain, that yields a difference between gain of the optical amplifier and a target gain, and a proportional circuit for multiplying proportional constant of the proportional circuit and said difference, and said adjusting device adjusts proportional constant of the proportional circuit as the control parameters.

Claim 25 (Currently Amended): The optical amplified transmission system as claimed in claim ~~23~~22, wherein said adjusting device adjusts control parameters of said automatic constant gain control device in response to a detected result of said optical input power from an optical device connected with said optical amplifying apparatus detected by said optical power detecting device or said optical input power varied by add / drop function

of an optical signal of wavelength division-multiplexing device in said optical device connected with said optical amplifying apparatus.

Claim 26 (Original): The optical amplified transmission system as claimed in claim 25, wherein said automatic constant gain control device includes a differential circuit for subtracting gain of the optical amplifier from a target gain, that yields a difference between gain of the optical amplifier and a target gain, and a proportional circuit for multiplying proportional constant of the proportional circuit and said difference, and said adjusting device adjusts proportional constant of the proportional circuit as the control parameters.

Claim 27 (Currently Amended): An optical amplified transmission system for amplifying an optical signal transmitted to the optical transmission line by a plurality of optical amplifying apparatuses connected in series including at least one optical amplifying apparatus which includes:

at least one optical amplifier amplifying an optical signal transmitted through the optical transmission line;

an optical power detecting device for detecting an optical power of the optical signal on the optical transmission line;

a wavelength division-multiplexing device for add / drop function of an optical signal of a prescribed wavelength to/from said optical transmission line;

a gain detecting device to detect gain of said optical amplifier;

a difference calculating device to obtain difference between a detected gain and a target gain; and

an automatic constant gain control device for implementing a proportional calculation and an integral calculation of said difference to obtain a drive current of at least one pump

laser diode provided in said optical amplifier and controlling gain of said optical amplifier to be constant by controlling current of said pump laser diode based on a calculated drive current value, wherein

the optical amplifying apparatus further includes an adjusting device for adjusting control parameters of said automatic constant gain control device in response to a detected result of an optical input power to said optical amplifier which is detected by the optical power detecting device, the automatic constant gain control device with said control parameters adjusted controlling gain of the optical amplifier in response to optical input/output power detected by the optical power detecting device.

Claim 28 (Cancelled):

Claim 29 (Currently Amended): The optical amplified transmission system as claimed in claim ~~28~~27, wherein said automatic constant gain control device includes a differential circuit for subtracting gain of the optical amplifier from a target gain, that yields a difference between gain of the optical amplifier and a target gain, and a proportional circuit for multiplying proportional constant of the proportional circuit and said difference, and said adjusting device adjusts proportional constant of the proportional circuit as the control parameters.

Claim 30 (Currently Amended): The optical amplified transmission system as claimed in claim ~~28~~27, wherein said adjusting device adjusts control parameters of said automatic constant gain control device in response to a detected result of said optical input power from an optical device connected with said optical amplifying apparatus detected by said optical power detecting device or said optical input power varied by add/drop function of

an optical signal of wavelength division-multiplexing device in said optical device connected with said optical amplifying apparatus.

Claim 31 (Original): The optical amplified transmission system as claimed in claim 30, wherein said automatic constant gain control device includes a differential circuit for subtracting gain of the optical amplifier from a target gain, that yields a difference between gain of the optical amplifier and a target gain, and a proportional circuit for multiplying proportional constant of the proportional circuit and said difference, and said adjusting device adjusts proportional constant of the proportional circuit as the control parameters.

Claim 32 (Original): An optical amplified transmission system for amplifying an optical signal transmitted to the optical transmission line by a plurality of optical amplifying apparatuses connected in series including at least one optical amplifying apparatus which includes:

at least one optical amplifier for amplifying an optical signal transmitted to the optical transmission line;

an optical power detecting device for detecting an optical power of the optical signal on the optical transmission line;

an automatic constant gain control device for controlling gain of the optical amplifier to be constant; and

an adjusting device for adjusting control parameters of the automatic constant gain control device in response to a detected result of an optical output power from said amplifier which is detected by the optical power detecting device.